

# The taxonomic status of the opisthobranch mollusc *Bulla tenuissima* Sowerby 1868

by Fred E. Wells

Western Australian Museum  
Perth, 6000, Australia

## ABSTRACT

Based on an examination of type material, *Bulla tenuissima* Sowerby, 1868, described from Western Australia, is shown to be a synonym of *B. quoyii* Gray, 1843 of southern Australia and New Zealand. The range of the species in Western Australia is shown to be from the South Australian border to Carnarvon.

## INTRODUCTION

Two species of the opisthobranch genus *Bulla* have been recorded from southwestern Australia: *B. quoyii* Gray, 1843 and *B. tenuissima* Sowerby, 1868. *B. quoyii* has been reported from various localities by several authors: Quoy and Gaimard (1833) (King George Sound and Princess Royal Harbour; as *Bulla australis* Quoy and Gaimard, 1833); Verco (1912) (Geraldton; as *Bulla australis* Gray, 1825); Hedley (1916) (based on the previous two records; as *Bullaria australis* (Gray, 1825); Hodgkin and Marsh (1957) (Perth area; as *Quibulla botanica* (Hedley, 1918) Macpherson and Gabriel (1962; as *Bullaria botanica* (Hedley, 1918); Hodgkin *et al.* (1966) (NSW to Houtman Abrolhos, WA; as *Bullaria botanica* (Hedley, 1918); and Roberts and Wells (1980) (Albany; as *Bulla quoyii* Gray in Dieffenbach, 1843). In an analysis of three species of *Bulla*, Willan (1978) recognised all of the above names as synonyms of *Bulla quoyii* Gray, 1843. *Bulla tenuissima* has also been recorded in Western Australia on several occasions: Sowerby (1868) (Swan River; type locality); Hedley (1916) (based on the Sowerby record); Macpherson (1954) (Recherche Archipelago); Hodgkin and Marsh (1957) (Perth area); and Chalmer *et al.* (1976) (Swan River) and in South Australia (Cotton and Godfrey, 1933). *Bulla quoyii*, (as *B. botanica*) has also been recorded in the W.A. fossil record by Reath (1925), Kendrick (1960) (both Swan River area) and Ludbrook (1978) (Roe Plains). Ludbrook (1978) considered the fossil history of the species to be from the Early Pleistocene to the Holocene.

There has been confusion in the separation of *B. quoyii* and *B. tenuissima*. Cotton and Godfrey (1933) regarded them as separate species but later (1938) believed them to be synonymous. Cotton (1959) regarded *B. quoyii* (as *Bullaria australis*), (Gray, 1825) as a synonym of *B. tenuissima*. However, Hodgkin and Marsh (1957) regarded the two as separate species. *B. tenuissima* was described as "2.5 cm, shell mottled light and dark brown, smooth, polished, thin. Animal light brown." The

habitat was listed as estuarine sandy bottoms. Only one figure was given which was intended to separate the two *Bulla* species from other gastropods. Macpherson and Gabriel (1962) recognised *B. quoyii* (as *Bullaria botanica*) as a valid species separable from *B. tenuissima*: "a small very thin-shelled species from Swan River, Western Australia." In his analysis of *B. quoyii*, Willan (1978) did not consider the status of *B. tenuissima*. The purpose of the present paper is to demonstrate that *B. tenuissima* is a synonym of *B. quoyii* and to clarify the range of the species in Western Australia.

## TAXONOMY

1843. *Bulla quoyii* Gray, J.E. Catalogue of the species of Mollusca and their shells, which have hitherto been recorded as found at New Zealand, with the description of some lately discovered species. In Dieffenbach, E., Trav. N.Z. 2:243. Figures 1-3. Type locality: New Zealand.

1868. *Bulla tenuissima*, Sowerby, G.B. Conch. Icon. 16 (*Bulla*): plate 2, figure 4. Type locality: Swan River, W.A.

A comprehensive list of other synonyms is given by Willan (1978).

### Type material examined:

*Bulla quoyii* — 10 syntypes from the British Museum (Natural History), registration numbers 1842.11.18.135-142.

*Bulla tenuissima* — 1 syntype from the British Museum (Natural History), registration number 197650.

### Description of shell:

Shell thin, ovoid, with moderately convex whorls, up to 60 mm long (Figs. 1-2). The spire is depressed and surrounded by later whorls. The posterior lip margin is rounded, the outer lip is straight and the anterior margin is rounded. The aperture is white with the external colouration showing through. There is a pronounced white callus on the umbilical region which extends posteriorly along the inner margin of the whorl. The posterior aperture is narrow but it is greatly expanded anteriorly. The outer shell is smooth except for fine growth lines. A series of very fine spiral lines goes across the anterior base of the shell. These lines begin near the umbilicus but do not reach the outer lip. The shell is mottled with purple, grey, off-white and brown, often forming a zig zag pattern. The periostracum is light brown, but is absent in dead collected shells.

### Discussion:

The original descriptions of *B. quoyii* and *B. tenuissima* were based only on dead shells. Rudman (1970; 1971) has provided some anatomical information on *B. quoyii*. Willan (1978) has shown that the shell of *B. quoyii* is variable in colour and shape. The Australian form reaches a larger size and had been thought to be lacking the fine spiral lines found in the New Zealand form. However on close examination, the Australian shells can be seen to have the spiral lines anteriorly. The type series of *B. quoyii* consists of ten syntypes ranging in length from 10.0 to 23.8 mm; the largest is an adult and the remainder are juveniles. The juvenile shells are fragile and have a much more rounded appearance than the adult (Figs. 3-6). The internal callus of the juveniles is faint. The syntype of *B. tenuissima* (Fig. 7), a juvenile 21.7 mm long, also has a faint callus and a fragile shell. In comparison with the *B. quoyii* type series, the *B. tenuissima* syntype is relatively longer and thinner. However this shell fits within the variation shown by Willan (1978) for *B. quoyii*, so *B. tenuissima* must be considered to be a synonym of *B. quoyii*.

### Habitat:

On subtidal sand and seagrass beds to a depth of 41 m. Juveniles are also common in sand patches on platform reefs in the Perth area and at Rottnest Island. The species is nocturnal, emerging from the sand at night. It is frequently found on jetty pilings at night.

**Range:**

*B. quoyii* is a wide-ranging Australasian species. It occurs throughout the North Island of New Zealand and also extends into warmer bays in N.W. Nelson in the South Island. In Australia it extends throughout New South Wales, Victoria, Tasmania, and South Australia, and it reaches as far north as Carnarvon in Western Australia (present records). It is very rare in northern New South Wales and does not reach Queensland. Willan's (1978) record of Trinity Bay, Cairns, Qld. was erroneous (R.C. Willan, pers. comm. 1984). This range shows *B. quoyii* possesses a temperate distribution and not a tropically-based one as claimed by Roberts and Wells (1980).

**W.A. Museum material from W.A.:**

**Recent:** D and W are the number of dry and wet lots respectively): Eucla (1D); S. of Mundrabilla (1D); Duke of Orleans Bay (1D); 16 km east of Hopetoun (1D); Hamersley Inlet (1D); Bremer Bay (2D, 1W); Pallinup Estuary (1D); Cheyne Beach (1D); King George Sound (3D; 1W); Oyster Harbour (4D; 5W); Princess Royal Harbour (2D); Nornalup Inlet (1D); Windy Harbour, Pt D'Entrecasteaux (1D); Augusta (3D; 1W); Hamelin Bay (1W); Margaret River (1D; 1W); Kilcarnup (1W); Cowaramup Bay (4D); Cape Naturaliste (3D); Bunbury (2D); beach south of estuary, Mandurah (1D); Warnbro Sound (2D); Pt Peron (2D); Careening Bay, Garden I. (6D); other Garden I. (2D); west of Garden I. (2D; 1W); Cockburn Sound (6D; 5W); Carnac I. (2D; 1W); Stragglers Rocks (1D); off Fremantle (6D); Swan Estuary (7D; 1W); Leighton Beach (1D); Cottesloe (3D; 2W); Rottnest I. (1D; 3W); City Beach (1D); Triggs (3D); Yanchee (1D); Long I., Jurien Bay (1D); Green Head (2D); Greenough River (1D; 1W); Pelsart Group, Houtman Abrolhos (2D); Zeewyk Channel (1D); Easter Group (1D); Wallabi Group (8D); North I., Houtman Abrolhos (1D); Kalbarri (1D); Shark Bay (1D); Carnarvon (1W).

**Fossil:**

Roe Plains (12 lots); Madura (1); Esperance (1); Hamersley Inlet (1); Bremer Bay (5); Albany (2); Augusta (1); Vasse (5); Ludlow state forest (1); Leschenault Inlet (1); Capel (1); Myalup (5); Pinjarra (1); Mandurah (1); Rockingham (3); Kwinana (1); Thompsons Lake, Success (1); Fremantle (2); Attadale (1); Jandakot (7); Rottnest I. (5); Swan estuary (3); Peppermint Grove (14); Mosman Park (5); Cottesloe (1); Scarborough (1); Ocean Reef (1); Geraldton (3).

**ACKNOWLEDGEMENTS**

The loan of types was kindly arranged by K. Way of the British Museum (Natural History). C. Bryce took the photographs and G.W. Kendrick arranged access to the W.A. Museum fossil material and provided relevant information. R. Burn and Dr R. Willan kindly commented on a draft of the manuscript.

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Plate 1. Figs 1 and 2. Adult specimens of *Bulla quoyii* from Emu Point, Albany, W.A. (WAM N.1000 (50.3 mm) and N.1003 (52.3 mm). Fig. 3. Adult syntype of *B. quoyii* (BM(NH) 1842.18.135). (23.8 mm). Figs. 4-6 Juvenile syntypes of *B. quoyii* (BM(NH) 1842.18.136-138), 17.4 mm, 15.3 mm and 14.8 mm in length. Fig. 7. Syntype of *B. tenuissima* (BM(NH) 197650) (21.7 mm).